



Product Safety Data Sheet (MSDS)

1. Product and Company identification

Product name: Lithium Ion rechargeable Battery Module (LIM50EN)

Company name: GS Yuasa International Ltd.
Industrial Batteries & Power Sources Business Unit,
Power Supply System Production Division,
Development Department

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2. Composition and Information on Ingredients

Type of composition: Single or Mixture

Ingredient	CAS number	Content (wt %)
Lithium manganese oxide	12057-17-9	20 – 25
Lithium cobalt dioxide	12190-79-3	2 – 4
Lithium nickel dioxide	12031-65-1	2 – 4
Graphite	7782-42-5	8 – 13
Ethylene carbonate [※]	96-49-1	3 – 5
Ethyl Methyl Carbonate [※]	623-53-0	8 – 13
Lithium hexafluorophosphate [※]	21324-40-3	1 – 3

※electrolyte

3. Hazards Identification

In normal use, there is no influence on the person's health. Since the chemical is enclosed within the metal case and sealed up, the person can not touched the chemical directly. However, there is the possibility of the liquid leakage, generation of heat, and the gas formation when not properly used. In the worst case there is a possibility of the ignition. Moreover, there is a possibility of the liquid leakage, generation of heat, and the gas formation when the battery receives strong heat due to a fire.

4. First Aid measures

Take the following measures, when the internal battery materials begins to leak from a battery module.

- Inhalation of volatile gas
Blow your nose and gargle. Seek medical attention if necessary.
- Touching of the internal battery materials with skin
Wash the region with soap and plenty water. Remove the materials completely
- Touching of the internal battery materials with eyes
Immediately wash your eyes with fresh water continuously for at least 15 minutes. Seek medical attention if necessary.

5. Fire Fighting Measures

Fire fighting procedure

Wear protective equipment (protective glasses, protective gloves) to avoid touching internal battery materials on your eyes and skin directly. Do not bring the materials close to fire as they ignite easily. Open the window or turn on the ventilation fan to create fresh air conditions. Remain upwind in order to avoid inhaling volatile gas

Extinguishing media

Plenty of water, carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium, fire foam, HFC227ea (FM200)

6. Accidental Release Measures

Wear protective equipment (protective glasses, protective gloves) to avoid touching internal battery materials on your eyes and skin directly. Ventilate the area for avoiding inhaling volatile gas as much as possible.

7. Handling and Storage

Handling

- Do not disassemble the battery module.
- Do not make a hole or apply pressure.
- Do not heat or place near fire.
- Do not short-circuit the (+) and the (-) sides.
- Use only exclusive charger or keep on specified charging condition

Storage

- Store in cool place under 50 degree C.
- Store in ventilated place
- Do not store under high temperature even if it is temporary
- Prevent short-circuit
- Do not store with conducting material, water, seawater, strong oxidizers and strong acid

8. Exposure Controls, Personal Protection

No special protection is needed in normal use. Since the chemical is enclosed within the metal case and sealed up, the person can not touched the chemical directly. However, there is the possibility of the liquid leakage, generation of heat, and the gas formation when not properly used. However, ventilate the area well if improper usage occurs and the battery leaks electrolyte and volatile gas is released.

9. Physical / Chemical properties

Electrolyte: Non aqueous and volatile

Electrolyte	Flash point	Auto Ignition Temperature
ethylene carbonate	approx.143degree C	approx.460 degree C
ethyl methyl carbonate	approx.24degree C	approx.460 degree C

10. Stability and Reactivity

In normal use, there is no influence on the person's health. However, there is the possibility of the liquid leakage, generation of heat, and the gas formation when overheating is received from the outside.

11. Toxicological Information

Not applicable

12. Ecological Information

Not applicable

13. Disposal condition

The product must be disposed of as an industrial waste in conformity with national and local laws. In Japan the product classified into Industrial Waste.

14. Transportation Information

- Avoid leaving the battery under direct rain and direct sunlight
- Avoid leaving the battery in high temperature and high humidity and dew condensation
- Never drop, fall and break the cargo
- Indicate Lithium Ion rechargeable Battery in conformity with the regulations
- Please refer to section 7 "Handling and Storage"

The battery corresponds to Class 9 of the restriction recommendation on the transport of dangerous goods of United Nations.

15. Regulatory Information

International regulations

- Air transportation -
IATA DGR: Dangerous Goods Regulations 54th Edition.
UN: Recommendations on the Transport of Dangerous Goods, Model Regulations 17th rev.
UN/ID No.3480, No.3481
- Marine transportation - IMO IMDG Code

Japanese regulations

- Fire Service Law

16. Other Information

This data sheet provides guidance on health, safety and environmental aspects of the product. The data sheet is based on the present state of knowledge and current legislation and should not be construed as any guarantee of technical performance or suitability for particular applications.